

**WASHINGTON STATE DEPARTMENT OF ECOLOGY
POST OFFICE BOX 47600
OLYMPIA, WASHINGTON 98504-7600**

**IN THE MATTER OF
Longview Fibre Company
P.O. Box 639
Longview, Washington 98632**

**] No. 01-03
] FINAL APPROVAL
] OF PREVENTION OF
] SIGNIFICANT DETERIORATION
APPLICATION**

Pursuant to the United States Environmental Protection Agency (EPA) regulations for the Prevention of Significant Deterioration (PSD) set forth in Title 40, Code of Federal Regulations, Part 52 and regulations set forth in the Washington Administrative Code 173-400-141 the Washington Department of Ecology (Ecology) is proposing issuance of PSD 01-03. Based on the permit application from Longview Fibre Company and Ecology's investigative information used in developing the PSD permit, Ecology now finds the following:

FINDINGS

1. Longview Fibre (LFC) qualifies as a major stationary source because it is a kraft pulp mill that has the potential to emit more than 100 tons per year of several pollutants. It is located in an area which has been designated Class II for the purpose of PSD evaluation. The site is within an area that is in attainment for the national ambient air quality standards.
2. LFC is proposing a modification to its Longview, WA kraft pulp and paper mill that will increase paper machine primary production capacity from approximately 3,000 machine dry tons of paper (MDTP) per day to approximately 3,600 MDTP/day, on an annual average basis.
3. LFC submitted a notice of construction (NOC) application to Ecology for the proposed project on November 14, 2000. On December 13 2000, LFC requested an extension to the completeness determination period in order to submit supplementary information. Ecology determined the NOC to be complete on March 6, 2001. A draft approval of the PSD application was released for public comment on October 22, 2001. The comment period was closed December 6, 2001. A summary of Ecology's response to public comment is available in the permanent record for this approval.
4. Ecology issued a Determination of Nonsignificance relative to the State Environmental Policy Act (SEPA) on November 1, 2001. The public comment period ended November 19, 2001. Ecology received no comments.
5. Changes in the emission amounts due to the project and estimated emissions from the plant upon completion of the project are:

Table 1 Emissions Increases		
Pollutant	Net Change in emissions for PSD applicability¹ tons per year	Most recent two years actual emissions (1998-99) tons per year
NO _x (nitrogen oxides)	951.5	2,077
CO (carbon monoxide)	3,387.5	3,669
SO ₂ (sulfur dioxide)	670	1,215
PM ₁₀ (particulate matter <10 microns)	372.5	326
VOC (volatile organic compounds)	439	1,235
TRS/ H ₂ S ² (total reduced sulfur)	53	210 ³

The proposed modification is expected to result in increased emissions of each of the above criteria pollutants in quantities greater than the significant emission rates (SER) specified in 40 CFR 52.21(b)(23)(i) for Prevention of Significant Deterioration (PSD). Consequently, it is required that each of the above criteria pollutants undergo review under USEPA New Source Review guidance.

6. Best available control technology (BACT) is required for any individual emissions unit that contributes to the emissions increase that necessitated the PSD permit *and* that will be modified as part of the proposed project. Best available control technology (BACT) will be used to control VOCs from the paper machines, and NO_x, CO, VOCs, PM₁₀, SO₂, H₂S, and TRS from recovery furnaces (RF) numbers 18 and 19.

BACT for the paper machines is use of low-VOC additives.

BACT for recovery furnaces 18 and 19 for each criteria pollutant is as follows:

¹ Net emissions increase for PSD applicability determination is future potential to emit (PTE) minus the average of the most recent two years' actual emissions. LFC's recent levels of actual emissions have been substantially below its current PTE. This has been the result of a combination of operation below maximum plant capacity and achieving better-than-expected control of emissions. Actual emissions increases that will accompany the proposed 20% increase in plant capacity will depend on the plant's operating ratio and ability to maintain its recent quality of emissions control. Consequently, the net increases shown in the table represent a worst anticipated case.

² All TRS is assumed to be H₂S

³ No data available for 1998 and 1999. 40 CFR 52.21(b)(21)(iii) provides that allowable emissions may be presumed equivalent to actual emissions in the event actual emissions data are unavailable. Data submitted after the application for this permit modification indicated 18 tons actual TRS emissions for the year 2000.

For NO_x: Good combustion practice with an emissions limit of 95 ppm NO_x.

For CO/VOCs: Good combustion control of flame temperature and excess air. Corresponding emissions limits are 612 tons VOCs per year and 360 lbs. CO /hr. for Recovery Furnace 18 and 1,020 tons VOCs per year and 600 lbs. CO /hr. for Recovery Furnace 19.

- For SO₂ and PM₁₀: LFC will have a federally enforceable limit on emissions of these pollutants representing a 53% reduction for SO₂ and a 20% reduction for PM₁₀ from the currently allowed emissions levels. With this new baseline for potential SO₂ and PM₁₀, BACT is no further control application.
 - For H₂S and TRS: No further control application is either feasible or economically justifiable.
7. The proposed pollutant increases will not significantly impact air quality attainment under the National Ambient Air Quality Standards:
 - The proposed increases in emissions will not cause an exceedance of the National Ambient Air Quality Standards.
 - The proposed emissions increases are not significant contributors to the modeled increment consumption.
 8. None of the toxic air pollutant emission increases gave ambient concentration increases in excess of their corresponding acceptable source impact levels under Chapter 173-460 WAC.
 9. Criteria pollutant concentrations related to the proposed emissions increases did not exceed significance levels in any Class I area or the Columbia River Gorge.
 10. Visibility will not be significantly impaired in any Class I area or the Columbia River Gorge due to the emissions.
 11. Projected deposition of sulfur and nitrogen oxide chemical species on the Class I areas and the Columbia River Gorge is not significant.
 12. The proposed pollutant increases will not significantly impact sensitive plant or animal species in any Class I or Class II area.
 13. The proposed modifications and production increase will not have a significant effect on the surrounding area's population or economic growth.
 14. Ecology finds that all requirements are satisfied for PSD and new source review. Approval of the PSD permit is granted subject to the following conditions.

APPROVAL CONDITIONS

1. **Emissions limits, Monitoring and Reporting Requirements:** Table 2 encompasses Approval Conditions 1.1 through 1.107. The emission limits in Table 2 shall not be exceeded. Monitoring and reporting requirements in Table 2 shall be followed.
2. **Exhaust stack flow correlations:** At least annually, LFC shall update equations for calculation of gas flow from each recovery furnace and lime kiln exhaust stack.

- 2.1 The equations shall correlate exhaust stack gas flows to process rate from the emissions units (see Appendix 2). The correlation shall be based on linear regression analysis.
- 2.2 By January 31st of each year, LFC shall submit the updated equations, the data on which they are based, and the regression analyses to Ecology for approval. LFC may submit proposed updates more frequently at its option. An update for an emissions unit shall have occurred only when new data are submitted.
- 2.3 For emission units operated 6,000 hours or more since the last update, each update shall include at least 24 hours of new data, and drop an equal amount of the oldest data. For emission units operated less than 6,000 hours since the last update, the minimum hours of new data (and dropped oldest data) shall be
- $(\text{Hours of operation since last update}) \times 24 \div 6,260$, rounded to the nearest whole number.
- The updated equations shall take effect upon approval from Ecology.
3. **Initial Performance Tests:** Within six months after completion of the respective modifications to Recovery Furnaces 18 and 19 that are subject to this permit, Recovery Furnaces 18 and 19 shall be subjected to initial performance tests.
- 3.1 LFC is to provide not less than two weeks prior notice to Ecology in writing of the scheduled performance test. Such notification shall include a detailed description of the intended performance test plan(s).
- 3.2 The performance tests shall include determination of emission concentrations and pounds per ton black liquor solids across Recovery Furnaces 18's and 19's range of operating levels. The lowest operating level during the test shall be not greater than 70% of the respective recovery furnace's "Operating Limit" in Table 2. The highest operating level during the test shall be not less than 90% of the respective recovery furnace's "Operating Limit" in Table 2.
- 3.3 Following are the relevant pollutants and corresponding test methods:
- PM and PM₁₀: Reference Method 5 of 40 CFR, Part 60, Appendix A, or Ecology Method 5 as found in the 'Source Test Manual - Procedures for Compliance Testing', 1983, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM₁₀.
- SO₂: Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO₂ source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFC Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO₂ monitoring mode.
- CO: Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.
- NO_x: Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology.
- H₂S/TRS: Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H₂S, or an alternative approved by Ecology.

VOCs: Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.

4. **Paper Machines:** Additives used in the paper-making process on the paper machines shall be “low-VOC”. LFC shall annually submit a list of additives used in the paper-making process on the paper machines and identify those that are not “low-VOC.”
5. **Stack modifications and replacements:** The exhaust stacks for Power Boilers 12, 13, 16, 17, and 20 and Lime Kilns 1, 2, 3, and 4 shall be modified or replaced. The modified or replaced exhaust stacks shall be designed such that modeled exhaust gas dispersion is equal to or better than that indicated for the originally-proposed design in the modeling reported in the application for this PSD permit. Plans for the stack design must be approved in writing by Ecology prior to initiation of construction of the stack. Construction of the modified or replacement stacks shall be consistent with design.
6. **Alternate compliance test methods :** Ecology may approve alternate compliance test methods that are of equivalent stringency for any air pollutant regulated by this permit.
7. **CEM QA plan:** Ecology may require periodically updating the continuous emission monitoring quality assurance plan submitted to Ecology on July 26, 1991 to be. The updates shall satisfy 40 CFR, Part 60, Appendix F, dated July 1, 1992 , or latest revision.
8. **Enforcement :** Any activity that is undertaken by LFC or others, in a manner which is inconsistent with the application and this determination, shall be subject to Ecology enforcement under applicable regulations. Nothing in this determination shall be construed so as to relieve LFC of its obligations under any state, local, or federal laws or regulations.
9. **Reporting :** LFC shall retain copies of all required reports to Ecology for at least five years. CEMS, source test, and process data shall be reported in written form to the Washington Department of Ecology Industrial Section or its authorized representative at least monthly (unless a different testing and reporting schedule has been approved by Ecology). The report shall be submitted in conformance with the time requirements included in Chapter 173-405 WAC, but in no case later than thirty days after the end of the calendar month being reported. The report shall be in a format approved by Ecology that shall include but not be limited to the following:
 - 9.1 Process or control equipment operating parameters.
 - 9.2 For each applicable emission unit, the pollutant concentrations in the units and averaging times of the standard shown in Table 2.
 - 9.3 For each applicable emission unit, total pollutant mass emissions in the units and averaging times of the standard shown in Table 2.
 - 9.4 The duration and nature of any monitor downtime.
 - 9.5 Results of any monitor audits or accuracy checks.
 - 9.6 Results of any stack tests performed since the last report.
10. **Exceedance reporting :** For each occurrence of monitored or measured emissions in excess of the standard the report to the Washington Department of Ecology Industrial Section or its authorized representative shall include the following:

- 10.1 The time of the occurrence.
 - 10.2 Magnitude of the emission or process parameters excess.
 - 10.3 The duration of the excess.
 - 10.4 The probable cause.
 - 10.5 Corrective actions taken or planned
 - 10.6 Any other agency contacted besides Ecology.
11. **O&M Manuals**: Operating and maintenance manuals for all equipment that has the potential to affect emissions to the atmosphere shall be developed and followed. Copies of the manuals shall be available to Ecology. Emissions that result from a failure to follow the requirements of the manuals may be considered proof that the equipment was not properly operated and maintained.
12. **Post-construction ambient air monitoring**: Within six months of the issuance of this permit, LFC shall submit to Ecology a monitoring plan for PM₁₀. As a minimum, the monitoring plan must satisfy the guidelines in the latest edition of Ambient Monitoring guidelines for Prevention of Significant Deterioration (PSD) (U.S. Environmental Protection Agency, Research Triangle Park, EPA Publication No. EPA-450/4-87-007, May 1987 or latest revision).
13. **Deadline**: This approval shall become invalid if construction of the project is not commenced within eighteen (18) months after receipt of final approval, or if construction of the facility is discontinued for a period of eighteen (18) months, unless Ecology extends the 18 month period upon a satisfactory showing that an extension is justified, pursuant to 40 CFR 52.21(r)(2) and applicable EPA guidance.
14. **Access** to the source by the US Environmental Protection Agency (EPA), Ecology or local regulatory personnel shall be permitted upon request for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.

Reviewed by

Bernard Brady, Environmental Engineer, Washington Department of Ecology, P.E.

Approved by

Mary Burg, Air Quality Program Manager, Washington Department of Ecology

Barbara McAllister, Director, EPA Office of Air Quality, Region X

Table 2
Emissions Limits, Monitoring and Reporting Requirements
PSD 01-03

Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.1	Recovery Furnace 15 (see table note 4)	1,150 TBLS/day	Not applicable	None	None	Report daily BLS production in tons		Monthly (see table note 5)
1.2			PM & PM ₁₀	0.033 gr/dscf @ 8% O ₂ , 1 hr. avg.	182.5 TPY	RM 5	M/Q	
1.3			SO ₂	60 ppmdv @ 8% O ₂ , 3 hr. avg.	365 TPY	RM 6C		
1.4			CO	630 lbs./hr., 8 hr. avg.	2,759 TPY	RM 10	A/M	
1.5			NO _x	95 ppmdv @ 8% O ₂ , 24 hr. avg.	434 TPY	RM 7		
1.6			TRS/H ₂ S (assume all TRS is H ₂ S)	17.5 ppmdv @ 8% O ₂ , 24 hr. avg.	59 TPY	PS 5	C	
1.7	Recovery Furnace 18 (see table note 4)	1,200 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.8			PM & PM ₁₀	0.044 gr/dscf @ 8% O ₂ , 1 hr. avg.	219 TPY Monthly average See table note 5, ¶ (2)(b)(i)	RM 5	M/Q	
1.9			SO ₂	60 ppmdv @ 8% O ₂ , 3 hr. avg.	202 TPY Monthly average See table note 5, ¶ (2)(b)(i)	PS 2	C	
1.10			CO	360 lbs./hr., 8 hr. avg.	1,577 TPY	RM 10	A/M	
1.11			NO _x	95ppmdv @ 8% O ₂ , 24 hr. avg.	452 TPY	RM 7		
			TRS/H ₂ S (assume all TRS is H ₂ S)	17.5 ppmdv @ 8% O ₂ , 24 hr. avg.	62 TPY	PS 5	C	
1.12			VOCs	None	612 TPY	RM 25A	Annually	

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				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.13	Recovery Furnace 19 (see table note 4)	2,000 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.14			PM & PM ₁₀	0.040 gr/dscf @ 8% O ₂ , 1 hr. avg.	292 TPY Monthly average See table note 5, ¶ (2)(b)(i)	RM 5	M/Q	
1.15			SO ₂	60 ppm _{dv} @ 8% O ₂ , 3 hr. avg.	301 TPY Monthly average See table note 5, ¶ (2)(b)(i)	PS 2	C	
1.16			CO	600 lbs./hr., 8 hr. avg.	2,628 TPY	RM 10	A/M	
1.17			NO _x	95ppm _{dv} @ 8% O ₂ , 24 hr. avg.	753 TPY	RM 7		
1.18			TRS/H ₂ S (assume all TRS is H ₂ S)	10 ppm _{dv} @ 8% O ₂ , 24 hr. avg.	59 TPY	PS 5	C	
1.19			VOCs	None	1,020 TPY	RM 25A	Annually	
1.20	Recovery Furnace 22 (see table note 4)	1,950 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.21			PM & PM ₁₀	0.027 gr/dscf @ 8% O ₂ , 1 hr. avg.	256 TPY	RM 5	M/Q	
1.22			SO ₂	120 ppm _{dv} @ 8% O ₂ , 3 hr. avg.	1,291 TPY	PS 2	C	
1.23			CO	300 ppm _{dv} @ 8% O ₂ , 8 hr. avg.	1,380 TPY	PS 4	C	
1.24			NO _x	95ppm _{dv} @ 8% O ₂ , 3 hr. avg.	735 TPY	PS 2	C	
1.25			TRS/H ₂ S (assume all TRS is H ₂ S)	3 ppm _{dv} @ 8% O ₂ , 12 hr. avg.	17 TPY	PS 5	C	

Table 2 Emissions Limits, Monitoring and Reporting Requirements PSD 01-03								
Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.26	Smelt Dissolving Tank 15	1,150 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.27			PM & PM ₁₀	0.12 lbs./TBLS	26 TPY	RM 5	M/Q	A/M
1.28			SO ₂	None	12 TPY	RM 6C		
1.29			CO	None	38 TPY	RM 10		
1.30			NO _x	None	7 TPY	RM 7		
1.31			TRS/H ₂ S (assume all TRS is H ₂ S)	None	67 TPY	RM 16		
1.32	Smelt Dissolving Tank 18	1,200 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.33			PM & PM ₁₀	0.12 lbs./TBLS	26 TPY	RM 5	M/Q	A/M
1.34			SO ₂	None	4 TPY	RM 6C		
1.35			CO	None	40 TPY	RM 10		
1.36			NO _x	None	7 TPY	RM 7		
1.37			TRS/H ₂ S (assume all TRS is H ₂ S)	None	67 TPY	RM 16		
1.38	Smelt Dissolving Tank 19	2,000 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.39			PM & PM ₁₀	0.12 lbs./TBLS	44 TPY	RM 5	M/Q	A/M
1.40			SO ₂	None	16 TPY	RM 6C		
1.41			CO	None	66 TPY	RM 10		
1.42			NO _x	None	11 TPY	RM 7		
1.43			TRS/H ₂ S (assume all TRS is H ₂ S)	None	114 TPY	RM 16		
1.44	Smelt Dissolving Tank 22	1,950 TBLS/day	Not applicable	None	None	Report daily BLS production in tons.		
1.45			PM & PM ₁₀	0.12 lbs./TBLS	44 TPY	RM 5	M/Q	

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Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.46			SO ₂	None	31 TPY	RM 6C	A/M	
1.47			CO	None	65 TPY	RM 10		
1.48			NO _x	None	11 TPY	RM 7		
1.49			TRS/H ₂ S (assume all TRS is H ₂ S)	0.0168 lbs./TBLS	6 TPY	RM 16		
1.50	Lime Kilns 1 and 2	140 tons CaO/day each	Not applicable	None	None	Report daily CaO production in tons.		
1.51			PM & PM ₁₀	0.030 gr/dscf @ 10% O ₂ , 1 hr. avg.	20 TPY, each	RM 5	M/Q	
1.52			SO ₂	20 ppmdv @ 10% O ₂ , 3 hr. avg.	16 TPY, each	RM 6C		
1.53			CO	1,400 ppmdv @ 10% O ₂ , 8 hr. avg.	339 TPY, each	RM 10	A/M	
1.54			NO _x	340 ppmdv @ 10% O ₂ , 24 hr. avg.	139 TPY, each	RM 7		
1.55			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 24 hr. avg.	6 TPY, each	PS 5	C	
1.56	Lime Kiln 3	240 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.57			PM & PM ₁₀	0.030 gr/dscf @ 10% O ₂ , 1 hr. avg.	34 TPY	RM 5	M/Q	
1.58			SO ₂	20 ppmdv @ 10% O ₂ , 3 hr. avg.	27 TPY	RM 6C		
1.59			CO	1,400 ppmdv @ 10% O ₂ , 8 hr. avg.	581 TPY	RM 10	A/M	
			1.60	NO _x	340 ppmdv @ 10% O ₂ , 24 hr. avg.	238 TPY		RM 7

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				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.61			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 24 hr. avg.	10 TPY	PS 5	C	
1.62	Lime Kiln 4	250 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.63			PM & PM ₁₀	0.030 gr/dscf @ 10% O ₂ , 1 hr. avg.	35.6 TPY	RM 5	M/Q	
1.64			SO ₂	20 ppmdv @ 10% O ₂ , 3 hr. avg.	28 TPY	RM 6C		
1.65			CO	1,400 ppmdv @ 10% O ₂ , 8 hr. avg.	605 TPY	RM 10	A/M	
			NO _x	340 ppmdv @ 10% O ₂ , 24 hr. avg.	248 TPY	RM 7		
1.66 1.67			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 24 hr. avg.	11 TPY	PS 5	C	
1.68		325 tons CaO/day	Not applicable	None	None	Report daily CaO production in tons.		
1.69	Lime Kiln 5		PM & PM ₁₀	When firing natural gas: 0.035 gr/dscf @ 10% O ₂ , 1 hr. avg.	69 TPY	RM 5	M/Q	
				When firing fuel oil: 0.060 gr/dscf @ 10% O ₂ , 1 hr. avg.				
1.70			SO ₂	20 ppmdv @ 10% O ₂ , 3 hr. avg.	28 TPY	RM 6C		
1.71			CO	500 ppmdv @ 10% O ₂ , 8 hr. avg.	282 TPY	PS 4	C	

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Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)		
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.72			NO _x	275 ppmdv @ 10% O ₂ , 24 hr. avg.	262 TPY	RM 7	A/M	
1.73			TRS/H ₂ S (assume all TRS is H ₂ S)	20 ppmdv @ 10% O ₂ , 12 hr. avg.	6 TPY	PS 5	C	
1.74	Power Boilers 12 and 13	444 MMBtu/hr. fuel application rate, each, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		Monthly (see table note 6)
1.75			PM & PM ₁₀	0.048 gr/dscf @ 7% O ₂ , 1 hr. avg.	186 TPY, each	RM 5	M/Q	
1.76			SO ₂	100 ppmdv @ 7% O ₂ , 3 hr. avg.	467 TPY, each	PS 2	C	
1.77			CO	2 lbs./MMBtu fuel application rate, 8 hr. avg.	1,945 TPY, each	RM 10	A/M	
1.78			NO _x	410 ppmdv @ 7% O ₂ , 24 hr. avg.	1,420 TPY, each	RM 7		
1.79	Power Boiler 16	525 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		Monthly by purchase records and vendor's reports
1.80			PM & PM ₁₀	0.1 gr/dscf @ 7% O ₂ , 1 hr. avg.	475 TPY	RM 5	M/Q	
1.81			SO ₂	250 ppmdv @ 7% O ₂ , 3 hr. avg.	1,357 TPY	Fuel sulfur reporting		
1.82			CO	340 ppmdv @ 7% O ₂ , 8 hr. avg.	2,300 TPY	RM 10	A/M	

Table 2
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				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting
1.83			NO _x	410 ppmdv @ 7% O ₂ , 24 hr. avg.	1,679 TPY	RM 7		
1.84	Power Boiler 17	591 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.85			PM & PM ₁₀	0.1 gr/dscf @ 7% O ₂ , 1 hr. avg.	511 TPY	RM 5	M/Q	
1.86			SO ₂	250 ppmdv @ 7% O ₂ , 3 hr. avg.	1,527 TPY	Fuel sulfur reporting		Monthly by purchase records and vendor's reports
1.87			CO	340 ppmdv @ 7% O ₂ , 8 hr. avg.	2,589 TPY	RM 10	A/M	Monthly (see table note 6)
1.88			NO _x	410 ppmdv @ 7% O ₂ , 24 hr. avg.	1,890 TPY	RM 7		
1.89	Power Boiler 20	900 MMBtu/hr. fuel application rate, See table note 7	Not applicable	None	None	Report daily maximum fuel consumption in MMBtu/hr.		
1.90			PM & PM ₁₀	0.048 gr/dscf @ 7% O ₂ , 1 hr. avg.	365 TPY	RM 5	M/Q	
1.91			SO ₂	100 ppmdv @ 7% O ₂ , 3 hr. avg.	946 TPY	PS 2	C	
1.92			CO	340 ppmdv @ 7% O ₂ , 8 hr. avg.	3,942 TPY	RM 10	A/M	

Table 2 Emissions Limits, Monitoring and Reporting Requirements PSD 01-03									
Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)			
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting	
1.93			NO _x	Gas-fired	0.2 lbs./MMBtu fuel application rate, 24 hr. avg.	1,183 TPY	PS 2	C	
				Other fuel	0.3 lbs./MMBtu fuel application rate, 24 hr. avg.				
1.94	Cogen 23	695 MMBtus/hr. fuel consumption, See table note 7	Not applicable	None		None	Report daily maximum fuel consumption in MMBtu/hr.		Monthly by purchase records and vendor's reports
1.95			PM & PM ₁₀	0.002 gr/dscf @ 15% O ₂ , 1 hr. avg.	None	RM 5	Triennially		
1.96			SO ₂	Only pipeline quality natural gas may be used as fuel.		Fuel sulfur reporting			
1.97			CO	12 ppmdv @ 15% O ₂ , 1 hr. avg. except during startup and shutdown.	481 lbs./day except during startup and shutdown	PS 4	C	Monthly (see table note 6). Report startup and shutdown data as separate items from data on normal operations.	
			Startup and shutdown: 200 ppmdv @ 15% O ₂ , 1 hr. avg.	Startup and shutdown: 1. 300 lbs./hr. 2. Not to exceed 3 hrs./day					

Table 2
Emissions Limits, Monitoring and Reporting Requirements
PSD 01-03

Condition number	Applicable units	Operating limit (see table note 1)	Pollutant	Emission Limit (see table note 2)		Monitoring and Reporting (see table note 3)				
				Concentration	Mass rate (See table notes 5 and 6) Tons per year (TPY)	Test Method	Test frequency	Reporting		
1.98			NO _x	7 ppmdv @ 15% O ₂ , 24 hr. avg.	461 lbs. day	PS 2	C			
1.99			VOCs	None	168 lbs./day	RM 25A	T/M			
1.100			Plantwide	Kraft pulp: 2,800 MDT/day, 12 month rolling average Total pulp: 3,600 MDT/day, 12 month rolling average	Not applicable	None	None		See table note 8	
1.101			PM & PM ₁₀		698.5					
1.102			SO ₂		1,885					
1.103			CO		7,056.5					
1.104			NO _x		3,028.5					
1.105			TRS/H ₂ S (assume all TRS is H ₂ S)		263					
1.106			VOCs		1,674					
1.107			2.6 million lbs./hr. steam production @ 800 psig @ the main header		Not applicable				None	Report daily maximum steam rate @ the main header, lbs./hr. @ 800 psig

¹ **Compliance with the operating limit** for each emission unit shall be made by recording and reporting the quantities from number (3), below:

- (1) Record the number of hours of operation of the emissions unit since the last report.
- (2) Record the total production through the emissions unit since the last report.
- (3) Divide the quantity from (2) by the quantity from (1), and multiply by twenty-four to get the average (24 hour) daily production.

² **Abbreviations:** gr/dscf = grains per dry standard cubic foot, ADTP = Air Dry Ton Pulp, TPY = tons per year, TBLS = tons black liquor solids, MMBtu = million Btus

³ (1) **Test methods** indicated are **abbreviations**. Details are given in **Appendix 1** of this permit.

- (2) “**A/M**” means source test is to be performed annually (see qualification, below). If any single source exceeds 75% of the limitation, source testing shall performed monthly until 6 consecutive month’s tests are below 75% of the limitation, at which time testing may return to an annual schedule.

“**M/Q**” means source test is to be performed monthly (see qualification, below). Source testing may be reduced to quarterly (see qualification, below) if 6 consecutive month’s tests are below 75% of the limitation. If any single source exceeds 75% of the limitation, source testing shall revert to monthly until 6 consecutive month’s tests are below 75% of the limitation.

“**T/M**” means source test is to be performed triennially. If any single source test exceeds 75% of the limitation, source testing shall be performed monthly (see qualification, below) until 6 consecutive month’s tests are below 75% of the limitation, after which source testing may return to triennially.

Qualification: If the emissions unit is on a "monthly" test cycle, a source test must be performed prior the emissions unit having been operated a total of 716 hours since the last source test. A "month" is counted toward a source test interval if the relevant unit has been operated over 216 hours in any calendar month. If the emissions unit is on a "quarterly" test cycle, a source test must be performed prior to the passage of three "months" or the emissions unit having been operated a total of 2,160 hours since the last source test whichever comes first.

“**A**”, relative to reporting frequency, means annually

“**C**” means testing is continuous by virtue of the CEM.

“**M**”, relative to reporting frequency, means monthly.

“**T**”, relative to reporting frequency, means triennially.

- (3) **Compliance determination using source testing** shall be as follows:

- During all emissions testing (source testing) runs, the concurrent process rate of the emission unit shall be recorded in units of measurement characteristic of the emission unit, and submitted with the source test data.
- An emissions unit with one stack: The arithmetic mean of three or more runs of at least one hour each in duration. NOTE: Compliance may be demonstrated for the SO₂ emission concentration limit on Lime Kiln 5 by applying this three-run protocol on one of its stacks.
- An emissions unit with two stacks: The arithmetic mean of runs made on both stacks. Two or more runs of at least one hour each in duration must be made on each stack.
- An emissions unit with four stacks: The arithmetic mean of runs made on all stacks. A minimum of one run of at least one hour’s duration must be made on each stack.
- Any test runs LFC believes to be invalid due to procedural error may be dropped from the arithmetic mean calculation. Results of such “invalid” runs are to be included in the monthly report with an explanation of the “invalid” determination.

4 During source tests on all recovery furnaces, primary voltage, primary current, opacity, and spark rate for the electrostatic precipitator shall be recorded for each field once during each source test and the data shall be submitted with the source test data. In addition, secondary voltage and secondary current data shall also be collected once during each source test and submitted along with the other data, when available. The department may modify or waive this requirement.

5 **Compliance with the mass rate limit** for the recovery furnaces, smelt dissolving tanks, and lime kilns shall be determined as follows:

- (1) **Emission Factor** : Pounds pollutant per ton process quantity for each emissions unit.

- (a) **Using source test data**: Use source test data for emissions units and pollutants not having CEMS. From the most recent source test results, convert the emission concentration, corresponding stack gas flow rate and emission unit process rate for each run to the equivalent pounds of pollutant emission per process unit of measurement, such as lbs. SO₂/lb. black liquor solids.

$$\text{Example 1: } \{[\text{source test ppm} \text{ SO}_2] \times (10^{-6}) \times [\text{source test dscfm}] \times (60 \text{ min./hr.}) \times (64 \text{ lb. SO}_2)\} \\ \div [(385 \text{ scf SO}_2) \times (\text{source test tons BLS /hr.})] = \text{lbs. SO}_2/\text{TBLs}$$

The same equation may be used for CO, NO_x, and H₂S/TRS by making the following respective substitutions for the term “64 lb. SO₂”:

28 lb. CO, 46 lb. NO_x, 34 lb. H₂S/TRS, and 12 lb. VOCs as carbon.

Example 2: $\{[source\ test\ gr/dscf\ PM_{10}] \times (1b./7,000\ gr) \times [source\ test\ dscfm] \times (60\ min./hr.) \div (source\ test\ tons\ BLS\ /hr.)\} = lbs.\ PM_{10}/\ TBLs$

Example 3, Dry kilns: $\{[source\ test\ ppmvd\ SO_2] \times (10^{-6}) \times [source\ test\ dscfm] \times (60\ min./hr.) \times (64\ lb.\ SO_2)\} \div [(385\ scf\ SO_2) \times (source\ test\ tons\ CaO\ /hr.)] = lbs.\ SO_2/\ ton\ CaO$

The equation may be used for CO, NO_x, and H₂S/TRS by making the following respective substitutions for the term "64 lb. SO₂:"

28 lb. CO, 46 lb. NO_x, and 34 lb. H₂S/TRS

Example 4, Dry kilns: $\{[source\ test\ gr/dscf\ PM_{10}] \times (1b./7,000\ gr) \times [source\ test\ dscfm] \times (60\ min./hr.) \div (source\ test\ tons\ CaO/hr.)\} = lbs.\ PM_{10}/\ ton\ CaO$

Calculate the arithmetic mean of the source test runs for each pollutant and each emission unit as described in table note 3, above.

(b) **Using CEMS data:** Use CEMS data for applicable emissions units and pollutants.

- (i) Determine the average daily process throughput for each emissions unit: Recovery furnaces – tons black liquor solids per hour (TBLs/hr.). Lime kilns – tons calcium oxide per hour (CaO/hr.).
- (ii) From each average daily process throughput, calculate the related stack exhaust flow. Use the equations relating process throughput to stack exhaust flow currently approved by Ecology (see **Appendix 2** of this permit).
- (iii) Determine the daily average emission concentration for each emissions unit and pollutant having a related CEMS.
- (iv) Calculate the emissions factors for the reporting period. The examples in (1)(a), above may be used by substituting the corresponding quantities from (1)(b)(i), (ii), and (iii) for the "source test" quantities.

(2) **Tons per year :**

- (a) Amount processed through the emissions unit since the closing date of the last report.
 - (i) For recovery furnaces and smelt dissolving tanks: Determine the total tons BLS processed through the emission unit since the closing date of the last report.
 - (ii) For the lime kilns: Determine the total tons CaO processed through the emission unit since the closing date of the last report.
- (b) For each pollutant and emissions unit, multiply the emission factor from (1) by the quantity processed [(2)(a)(i) for the recovery furnaces and smelt dissolving tanks or (2)(a)(ii) for the lime kilns], and divide by 2,000 lbs./ton. The result should be the tons of each pollutant that have been emitted from each emissions unit since the closing date of the last report.
 - (i) **Recovery Furnaces 18 and 19: For PM & PM₁₀ and SO₂ compliance demonstration,** multiply the respective quantity from (2)(b) by a factor sufficient to normalize to one year. . Each such quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance
 - (ii) **All other emissions units and pollutants:** Add up the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of pollutant emissions for each emissions unit. Each such quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance.

⁶ **Compliance with mass rate limits** for the power boilers and Cogen 23:

- (1) **Emission Factor,** Pounds pollutant per ton process quantity for each emissions unit: Convert each emission concentration, corresponding stack gas flow rate, and power boiler and Cogen fuel application rate to the equivalent pounds of pollutant emission per million Btu (lb./MMBtu). In the examples below,
 - (a) If continuous emissions monitoring (CEM) has been installed: Apply the examples in this table note, below. Pollutant "*concentration*" is the average daily concentration. "*Exhaust gas flow*" may be calculated from the appropriate "F-factor(s)" from 40 CFR Part 60, Appendix A, Method 19 if not otherwise known. "*Fuel applied*" is to be determined from the average daily fuel composition. Exclude boiler and Cogen downtime from all calculations.
 - (b) If CEM data are not available, the pollutant *concentration*, *exhaust gas flow*, and *fuel applied* are from the most recent source test run results. Where source test data are used, apply the examples in this table note, below, to each of the source test runs for each pollutant and each power boiler and Cogen 23. Calculate the arithmetic mean as described in table note 3, above.

- (c) For Power Boilers 16 and 17 and Cogen 23, calculate SO₂ emissions (lbs. SO₂/MMBtu) from the purchase records and vendor's reports on fuel sulfur content for the fuel applied during the reporting period.

$$\text{Example 1: } \{ [\text{SO}_2 \text{ concentration ppmdv}] \times (10^6) \times [\text{exhaust gas flow dscfm}] \times (60 \text{ min./hr.}) \times (64 \text{ lb. SO}_2) \} \\ \div [(385 \text{ scf SO}_2) \times (\text{fuel applied MMBtu/hr.})] = \text{lbs. SO}_2/\text{MMBtu}$$

The equation may be used for CO, NO_x, and H₂S/TRS by making the following respective substitutions for the term "64 lb. SO₂:"

28 lb. CO, and 46 lb. NO_x.

$$\text{Example 2: } \{ [\text{PM}_{10} \text{ concentration gr/dscf}] \times (1\text{b./}7,000 \text{ gr}) \times [\text{exhaust gas flow dscfm}] \times (60 \text{ min./hr.}) \div (\text{fuel applied MMBtu/hr.}) \} = \text{lbs. PM}_{10}/\text{MMBtu}$$

(2) Tons per year :

- (a) Determine the total fuel applied to each power boiler and Cogen 23 since the closing date of the last report in MMBtu.
- (b) For each pollutant and the Cogen and each power boiler, multiply the respective quantities from (1) and (2)(a), and divide by 2,000 lbs./ton. The result should be the tons of each pollutant emitted from the Cogen and each power boiler since the closing date of the last report. Add this quantity to the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of emissions for the Cogen and each power boiler. This quantity must be less than the corresponding limit (TPY) in Table 2 to demonstrate compliance.

(3) Cogen daily and hourly mass emission limits:

- (a) Find the maximum 24 hour fuel applied to Cogen 23 since the closing date of the last report in MMBtu, excluding startup and shutdown periods.
- (b) For CO, NO_x, and VOC daily mass emissions, multiply the respective quantities from (1) and (3)(a). These quantities must be less than the corresponding limits in Table 2 to demonstrate compliance.
- (c) Find the maximum one hour fuel applied to Cogen 23 since the closing date of the last report in MMBtu for startup and shutdown periods.
- (d) For CO startup/shutdown hourly mass emissions, multiply the CO emission factor from (1) and the quantity from (3)(c). This quantity must be less than the corresponding limit in Table 2 to demonstrate compliance.

⁷ Either Power Boiler 12, 13, 16, 17, or 20 must be off-line when Cogen 23 is operating. Four hours of operational overlap is allowed for normal startup and shutdown. Compliance shall be demonstrated from recording charts and operators' logs.

⁸ Compliance determination for plant wide limits

- (1) Report daily Kraft and total machine dry pulp production in tons. Add sufficient contiguous periods including the current reporting period to give a twelve month total.
- (2) For PM & PM₁₀, SO₂, CO, and NO_x: For each pollutant, add the emissions calculated for the period since the close of the last report from the recovery furnaces (15, 18, 19, and 22), the smelt dissolving tanks (15, 18, 19, and 22), the lime kilns (1 through 5), the power boilers (12, 13, 16, 17, and 20), and Cogen 23 to the analogous quantities calculated for sufficient contiguous prior periods to total one year's worth of emissions concluding with the close of the current reporting period.
- (3) For VOCs:
 - (a) Determine the total tons of black liquor solids processed through all recovery furnaces and smelt dissolving tanks for the one year period ending with the close of the reporting period.
 - (b) Determine the total tons of CaO produced by each lime kiln for the one year period ending with the close of the reporting period.
 - (c) Determine the average fuel application rate for each power boiler and Cogen 23 (MMBtu/hr.) for the one year period ending with the close of the reporting period. Add them together.
 - (d) Multiply the quantity from (1) by 3.37 to give the pounds of VOCs during the past twelve months from paper making and miscellaneous equipment.
 - (e) Multiply the quantity from (3)(a) by 0.21 to give the pounds of VOCs during the past twelve months from recovery furnaces and smelt dissolving tanks.
 - (f) Multiply the quantity from (3)(b) by 0.026 to give the pounds of VOCs during the past twelve months from the lime kilns and related lime recovery equipment.
 - (g) Multiply the quantity from (3)(c) by 117.4 to give VOCs from the power boilers and Cogen 23.
 - (h) Add the quantities from (3)(d) through (3)(g), and divide the result by 2,000 to give tons per year (TPY) VOCs, plantwide.

Appendix 1

to PSD 01-03

Test Methods : Abbreviations for the test methods indicated as required in Table 2 of PSD 01-03 are defined as follows:

RM 5 Determination of Particulate Emissions from Stationary Sources

For NSPS sources including Recovery Furnace No. 22, Smelt Dissolving Tank No. 22, Lime Kiln No. 5, and Power boiler No. 20; Reference Method 5 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM₁₀.

For all other sources; Reference Method 5 of 40 CFR, Part 60, Appendix A, or Ecology Method 5 as found in the 'Source Test Manual - Procedures for Compliance Testing', 1983, or an alternative approved by Ecology, under the assumption that all of the particulate collected is PM₁₀.

RM 6C Determination of Sulfur Dioxide Emissions from Stationary Sources

Reference Method 6C of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. For SO₂ source tests conducted on a stack with a continuous TRS monitor, the test may be conducted using LFC Source Test Method 201, a modification of Method 6C which uses the TRS monitor in an SO₂ monitoring mode.

RM 7 Determination of Nitrogen Oxide Emissions from Stationary Sources

Reference Method 7 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFC Source Test Method ???, which uses a certified portable NO_x emission monitor, may be used as an approved test procedure.

RM 10 Determination of Carbon Monoxide Emissions from Stationary Sources

Reference Method 10 of 40 CFR, Part 60, Appendix A, or an alternative approved by Ecology. LFC Source Test Method ???, which uses a certified portable CO emission monitor, may be used as an approved test procedure.

RM 16 Semicontinuous Determination of Sulfur Emissions from Stationary Sources

Reference Method 16 of 40 CFR, Part 60, Appendix A, and measured as H₂S, or an alternative approved by Ecology. LFC Source Test Method 202, which captures gas in a Tedlar bag for analysis, may be used to test smelt dissolving tank TRS emissions.

RM 25A Determination of Total Gaseous Organic Concentration using Flame Ionization analyzer
Reference Method 25A of 40 CFR, Part 60, Appendix A, and measured as C, or an alternative approved by Ecology.

PS 2 Performance Specification 2 of 40 CFR, Part 60, Appendix B, "Specification and Test Procedures for SO₂ and NO_x Continuous Emissions Monitoring Systems in Stationary Sources."

PS 4 Performance Specification 4 of 40 CFR, Part 60, Appendix B, "Specification and Test Procedures for Carbon Monoxide Continuous Emissions Monitoring Systems in Stationary Sources."

PS 5 "Specification and Test Procedures for TRS Continuous Emissions Monitoring Systems in Stationary Sources."

Appendix 2

to PSD 01-03

Exhaust stack flow correlations :

1. **Recovery Furnaces:** Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

$$\text{Exhaust stack flow (dscfm @ 8\% O}_2\text{)} = a + b \times (\text{BLS production rate, lb./hr.})$$

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

$$a = 19,631$$

$$b = 1.3758$$

2. **Lime Kilns :** Exhaust stack flow from lime kilns is the sum of combustion exhaust and carbon dioxide generated by the calcine reaction. Where exhaust stack flow is not directly measured, for compliance purposed it may be calculated from the following general form.

$$\begin{aligned} \text{Combustion exhaust flow (dscfm @ 10\% O}_2\text{)} &= 1.917^* \times (\text{F-factor}^\star, \text{ dscf/MMBtu}) \\ &\quad \times (\text{lime kiln economy, Btu/ton CaO}) \\ &\quad \times \text{CaO production rate, tons/hr.}) \\ &\quad \div (60 \text{ min./hr.}) \end{aligned}$$

At the time of issuance of this PSD permit and until updated in accordance with Approval Condition 2, the coefficients in the above equation shall be

$$\text{F-factor} = 8,740 \text{ dscf/MMBtu}$$

$$\begin{aligned} \text{Lime kiln economy} &= 10 \times 10^6 \text{ Btu/ton CaO for lime kilns \#1 through \#4} \\ &\quad 6.5 \times 10^6 \text{ Btu/ton CaO for lime kiln \#5} \end{aligned}$$

$$\begin{aligned} \text{Calcine exhaust flow (dscfm @ 10\% O}_2\text{)} &= 1.917^* \times (13,750^\heartsuit \text{ dscf @ 10\% O}_2 \text{ per ton CaO}) \\ &\quad \times \text{CaO production rate, tons/hr.}) \\ &\quad \div (60 \text{ min./hr.}) \end{aligned}$$

Add Combustion exhaust flow and Calcine exhaust flow for total Lime Kiln exhaust flow.

♣ This coefficient adjusts to 10% O₂.

♦ From 40 CFR Part 60, Appendix A, Method 19

♥ Assuming ideal gas behavior, and based on the standard calcine reaction products.